

Appl. No. 10/757,202
Reply to Office Action of February 7, 2006

Attorney Docket No. 2002-0350 /24061.484
Customer No. 42717

REMARKS

Claims 1-3, 6, 8-10, 13 and 15-19 are currently pending in the application. In view of the remarks that follow, Applicants respectfully request reconsideration.

Allowed Claims

Noted with appreciation is the indication in the Office Action that Claims 1-3, 6, 8-10 and 13 have been allowed.

Comment on Statement of Reasons for Allowance

In the first paragraph on page 4 of the Office Action, the Examiner offers a statement of reasons why Claims 1-3, 6, 8-10 and 13 are considered to recite allowable subject matter. Applicants agree that Claims 1-3, 6, 8-10 and 13 recite allowable subject matter. However, Applicants do not agree in all respects with the stated reasons for allowance. For example, Applicants believe that the stated reasons should not be interpreted to mean that they are the only reasons supporting the allowability of these claims, and that there are no other reasons that separately and independently support the allowability of these claims.

Premature Finality

Applicants respectfully traverse the finality of the Office Action. In this regard, MPEP §706.07(a) specifies that an Office Action shall not be final "where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement".

With reference to the prior Office Action mailed on September 1, 2005, lines 1-6 on page 3 set forth a rejection of independent Claim 15 under 35 U.S.C. §103 for obviousness in view of Lee U.S. Patent Application Publication No. 2003/0166381. This §103 rejection from the prior Office Action is set forth in its entirety below:

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4. Claims 6, 13, 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee.

Unlike claimed invention, Lee doesn't describe the initial polishing comprises a control of polishing time so as to avoid over-polishing of a stop layer. However, he suggests leaving some of the polished oxide layer on the polishing stop layer (paragraph [0088]). Therefore, one skilled in the art at the time of the invention would find it obvious to control the polishing time in order to leave some of the polished oxide layer on the polishing stop layer.

This prior rejection cites only paragraph [0088] of Lee, which is part of Lee's Experimental Example 7. Stated differently, the prior §103 rejection was based solely on Experimental Example 7 in Lee.

In contrast, the present Office Action sets forth a §103 rejection of Claim 15 based on Lee, but the Examiner does not use the same rationale as in the prior rejection (i.e. the rationale set forth in the paragraph quoted above). Instead, the Examiner offers a new and different rationale. More specifically, the new §103 rejection from the present Office Action is set forth in its entirety below:

2. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee.

Lee describes a method for polishing a shallow trench isolation substrate comprising: providing a substrate having a plurality of patterned regions; polishing the substrate with a first slurry until partial planarization occurs; continuing to final

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polishing with a second slurry (fig. 5; paragraphs [0088-0089]).

Experimental example 1 shows that the APC concentration can be added, depending on desired removal rate of oxide layer, from 0.2 to 1.2 wt% where a 0.4-0.8 wt% has a higher selectivity ratio, than 0.2 wt%. Therefore, wherein a first planarization slurry contains 0.2 wt% of APC, the second slurry would have 0.4-0.8 wt% of APC in order to have a high selectivity ratio as suggested by Lee.

Unlike claimed invention, Lee doesn't describe the initial polishing comprises a control of polishing time so as to avoid over-polishing of a stop layer. However, he suggests leaving some of the polished oxide layer on the polishing stop layer (paragraph [0088]).

Therefore, one skilled in the art at the time of the invention would find it obvious to control the polishing time in order to leave some of the polished oxide layer on the polishing stop layer.

It can be seen from a glance that this new §103 rejection is longer than and different from the prior §103 rejection. Moreover, the prior §103 rejection relied solely on Lee's Experimental Example 7. But this new §103 rejection specifically relies on at least three different embodiments disclosed in Lee, including:

1. Experimental Example 7 (paragraphs [0088-0089]).
2. Experimental Example 1.
3. One embodiment of a CMP technique that is shown in Figure 5 and discussed in the associated text beginning at paragraph [0056].

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In other words, the prior §103 rejection was based on just one embodiment disclosed in Lee, but the new §103 rejection combines multiple embodiments that are disclosed in Lee. Consequently, the present Office Action sets forth a new and different ground of rejection under §103.

Applicants' last Response amended Claim 15, but only to make a very minor grammatical correction in Claim 15, namely the addition of a colon (:) at the end of the preamble. The scope and subject matter of Claim 15 was not changed at all. Consequently, the present Office Action represents a situation where, in the words of MPEP §706.07(a), "the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement". Therefore, as specified in MPEP §706.07(a), the present Office Action cannot properly be made a "final" rejection. Accordingly, it is respectfully submitted that the finality of the Office Action must be withdrawn, and notice to that effect is respectfully requested.

Independent Claim 15

Turning to the merits, and as noted earlier, independent Claim 15 stands rejected under 35 USC §103 on the ground that it would be obvious in view of Lee. This ground of rejection is respectfully traversed. In this regard, the PTO specifies in MPEP §2142 that:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicants respectfully submit that Lee fails to establish a *prima facie* case of obviousness under §103 with respect to Claim 15, for the mutually exclusive reasons that are discussed below.

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THE §103 REJECTION FAILS TO COMPLY WITH PTO REQUIREMENTS

As discussed earlier, the new §103 rejection in the present Office Action combines at least three embodiments disclosed in Lee, including (1) Experimental Example 7 (paragraphs [0088-0089]), (2) Experimental Example 1, and (3) one embodiment of a CMP technique that is shown in Figure 5 and discussed in the associated text beginning at paragraph [0056]. Where multiple embodiments are being combined, it does not matter whether they are from respective different references, or are all from the same reference. In order to combine multiple embodiments under any circumstances, the Examiner must satisfy certain PTO requirements. More specifically, MPEP §706.02(j) addresses §103 rejections in which two or more embodiments are being combined (or in other words where one embodiment is being modified in view of at least one other embodiment), and explains that an examiner must satisfy four specific requirements in order to establish a prima facie case of obviousness under 35 U.S.C. §103, as follows:

After indicating that the rejection is under 35 U.S.C. 103, the examiner should set forth in the Office action:

(A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,

(B) the difference or differences in the claim over the applied reference(s),

(C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and

(D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

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In the present situation, the §103 rejection fails to satisfy three of these four requirements, for reasons that are discussed separately below for each of the four requirements.

First, the rejection does at least partially satisfy requirement (A), because it identifies at least some of the portions or embodiments of Lee that are being relied on in the rejection.

However, the rejection does not fully satisfy requirement (B). In this regard, the rejection does note that Lee fails to disclose control of polishing time in a particular manner, and then asserts that a person skilled in the art would find it obvious to do this, even though it is not disclosed in Lee. But this falls short of what is needed in order to meet requirement (B). In particular, the §103 rejection is combining teachings from multiple embodiments in Lee, but the rejection fails to identify one of these multiple embodiments that is to be modified in view of the other embodiments, and also fails to identify the differences between that selected embodiment and the subject matter of Applicants' Claim 15.

Moreover, the rejection fails to satisfy requirement (C), because the rejection never identifies precisely what modifications would be needed in the one selected embodiment in order to arrive at the subject matter of Applicants' Claim 15.

In addition, the rejection fails to satisfy requirement (D), because the explanation of the rejection never discusses why one of ordinary skill in the art would have been motivated to make any modification to the one selected embodiment in view of the other embodiments that are relied on in the rejection.

Applicants therefore respectfully submit that the §103 rejection is defective, because it fails to satisfy three of the PTO's four specific requirements for a §103 rejection. Thus, according to MPEP §706.02(j), the Examiner has failed to carry the burden of establishing a prima facie case of obviousness. And since the Examiner has failed to establish a prima facie case of obviousness, Applicants are not required to try to respond to the §103 rejection on the merits. In particular, as discussed in MPEP §2142, where an examiner fails to meet the requirements needed to establish a prima facie case of obviousness, "the applicant is under no obligation to submit evidence of nonobviousness". For this reason alone, it is respectfully

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submitted that the pending §103 rejection is defective must be withdrawn, and notice to that effect is respectfully requested.

THE PRIOR ART MUST TEACH ALL CLAIM LIMITATIONS UNDER §103

The provisions of MPEP §2142 specify with respect to §103 that:

To establish a *prima facie* case of obviousness . . . the prior art reference (or references when combined) must teach or suggest all the claim limitations. (Emphasis added).

The PTO considers this requirement to be important, as evidenced by the fact that this exact language appears not only in MPEP §2142, but also in other sections of the MPEP, including MPEP §706.02(j) and MPEP §2143. Applicants' Claim 15 includes a recitation of:

polishing said substrate with a diluted chemical mechanical polishing slurry composition and controlling polishing time so that said stop layer is not exposed; and

thereafter continuing to final planarization to said stop layer with a more concentrated composition of said chemical mechanical polishing slurry.

In the prior Office Action, the §103 rejection of Claim 15 relied on paragraph [0088] of Lee, which discusses Lee's Experimental Example 7. The remarks of Applicants's last Response explained that Lee's Experimental Example 7 is different from the subject matter of Claim 15, because Experimental Example 7 fails to disclose limitations from Claim 15 that are quoted above, including carrying out two different planarizations that use the same slurry, but in

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different concentrations. In the present Office Action, the Examiner takes issue with this argument, asserting that:

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. Lee fails to disclose carrying out two different planarizations that use the same slurry, but in different concentration) are not recited in the rejected claim(s).

Applicants respectfully disagree, because Claim 15 does recite this distinctive subject matter. More specifically, the above-quoted limitations from Claim 15 very clearly recite carrying out two different planarizations that use the same slurry, but in different concentrations (i.e. "a diluted chemical mechanical polishing slurry" and then "a more concentrated composition of said [same] chemical mechanical polishing slurry"). Consequently, there is no reasonable basis for the assertions in the Office Action that Applicants have argued distinctions that are not actually present in Claim 15.

A separate consideration is that, as mentioned above, the §103 rejection of Claim 15 in the prior Office Action cited and relied on only Experimental Example 7 in Lee. But as also discussed above, the §103 rejection of Claim 15 in the present Office Action is based on a combination of selected features from several embodiments of Lee, including Experimental Example 7, Experimental Example 1, and Figure 5. With respect to the slurry and its concentration, the Examiner relies on Lee's Experimental Example 1. More specifically, the present Office Action states that:

Experimental example 1 shows that the APC concentration can be added, depending on desired removal rate of oxide layer, from 0.2 to 1.2 wt% where a 0.4-0.8 wt% has a higher selectivity ratio, than

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0.2 wt%. Therefore, wherein a first planarization slurry contains 0.2 wt% of APC, the second slurry would have 0.4-0.8 wt% of APC in order to have a high selectivity ratio as suggested by Lee.

However, paragraph [0063] is part of the discussion of Lee's Experimental Example 1, and Lee explains in paragraph [0063] that:

... a plurality of slurries were prepared including 1 wt% of ceria as metal oxide abrasive particles and ammonium polycarboxylate (APC) as an anionic polymer passivation agent, while varying the content of the APC.

Thus, these slurries all contain 1 wt% of ceria, but they each contain a respective different wt% of APC. Consequently, since the relative amounts of ceria and APC are different in each of these slurries, these are different slurries that have different compositions, rather than being different concentrations of the same slurry. If these slurries from Lee were different concentrations of the same slurry, then the active components (such as ceria and APC) would all have the same relative proportions with respect to each other. Therefore, and contrary to the assertions in the Office Action, Experimental Example 1 of Lee does not disclose the use of two different planarizations that use the same slurry, but in different concentrations. Lee thus fails to satisfy the requirement of MPEP §2142 that the reference(s) underlying a §103 rejection must "teach or suggest all the claim limitations" (emphasis added). Lee therefore fails to establish a prima facie case of obviousness under §103 in the manner required by MPEP §2142. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 15 is not obvious under §103 in view of Lee, and notice to that effect is respectfully requested.

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THERE IS NO SUGGESTION OR MOTIVATION TO MODIFY LEE

The provisions of MPEP §2142 specify with respect to §103 that:

To establish a *prima facie* case of obviousness, . . . there must be some suggestion or motivation, . . . to modify the reference or to combine reference teachings. . . . The teaching or suggestion to make the claimed combination [or modification] . . . must . . . be found in the prior art, and not based on applicant's disclosure.

In the present situation, as discussed above, the §103 rejection addresses one facet of motivation by asserting that "one skilled in the art at the time of the invention would find it obvious to control the polishing time in order to leave some of the polished oxide layer on the polishing stop layer". However, additional motivation must also be shown in order to establish a *prima facie* case of obviousness. More specifically, as discussed earlier, the §103 rejection combines at least three different embodiments from Lee. Therefore, in order to meet PTO requirements, the §103 rejection needs to show (1) motivation to modify a first of these three embodiments in view of a second of the embodiments, and (2) motivation to modify the first embodiment in view of the third embodiment. However, the §103 rejection in the present Office Action is completely silent as to both of these aspects of motivation. The present §103 rejection of Claim 15 is therefore incomplete, because it does not identify at least two necessary modifications to one of the embodiments of Lee, much less demonstrate motivation to make each of these different modifications. As a result, the §103 rejection is effectively based on hindsight of the present invention, rather than on motivation properly derived from what was known prior to the present invention.

It is therefore respectfully submitted that the Examiner has failed to properly demonstrate all of the motivation that is needed in order to meet PTO requirements, and thus has failed to properly establish a *prima facie* case of obviousness. Accordingly, for this independent reason

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alone, it is respectfully submitted that Claim 15 is not obvious under §103 in view of Lee, and notice to that effect is respectfully requested.

In view of the various different reasons discussed above, it is respectfully submitted that the Office Action fails to properly establish a prima facie case of obviousness with respect to Applicants' Claim 15. Claim 15 is therefore believed to be allowable over Lee, and notice to that effect is respectfully requested.

Dependent Claims

Claims 16-19 depend from Claim 15, and are also believed to be patentably distinct from Lee, for example for the same reasons discussed above with respect to Claim 15.

Conclusion

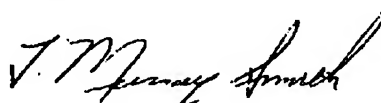
Based on the foregoing, it is respectfully submitted that all of the pending claims are fully allowable, and favorable reconsideration of this application is therefore respectfully requested. If the Examiner believes that examination of the present application may be advanced in any way by a telephone conference, the Examiner is invited to telephone the undersigned attorney at 972-739-8647.

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Although Applicants believe that no fee is due in association with the filing of this Response, the Commissioner is hereby authorized to charge any additional fee required by this paper, or to credit any overpayment, to Deposit Account No. 08-1394 of Haynes and Boone LLP.

Respectfully submitted,



T. Murray Smith
Registration No. 30,222
(972) 739-8647

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HAYNES AND BOONE, LLP
901 Main Street, Suite 3100
Dallas, Texas 75202-3789
Telephone: (972) 739-6900
Facsimile: (214) 200-0853
File: 24061.484

Enclosures: None

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